

TIME - 3 Hrs

Marks - 80

1. Question 1 is compulsory
2. Answer any 3 out of the remaining questions.

Q 1

- a) Explain the Triggers in SQL with two examples. (05)
- b) What are the different characteristics of a Data Warehouse? (05)
- c) What are ACID properties of a transaction? (05)
- d) What is the role of meta data in a data warehouse? (05)

Q 2

- (a) Design a schema in SQL for a Library System. Show one example each for PRIMARY KEY and FOREIGN KEY constraint. Create one assertion for the following Constraint:
"No member can borrow more than three books at a time" (10)

- (b) You have to design and implement a database that manages information about publishers, authors, and books. Some information includes :
- A publisher has a name and an address for the headquarters. Each publisher also has a set of branches, each branch having an address and two phone numbers.
 - An author has a name and an address.
 - A book is published by a publisher and has a list of authors associated with it. An author can publish several books and a book can be published by at most one publisher.

- i. Design an ODL schema for the above database. (05)
- ii. Write in OQL the following query:
List the name of the author who has published the most books with publisher "McGraw Hill" (05)

Q 3. Explain the following concepts with the help of examples

- a) SQL Injection (05)
- b) Access Control in a Database (05)
- c) Snowflake Schema (05)
- d) Factless Fact Table (05)

Q 4 (a) Consider the following database that has to be distributed:

PATIENT (Number, Name, SSN, Amount_Due, Dept, Doctor, Med_treatment)

DEPARTMENT (Dept, Location, Director)

STAFF (Staffnum, Director, Task)

- i. Show 2 examples of horizontal fragmentation (03)
- ii. Show 2 examples of vertical fragmentation (03)
- iii. Show 2 examples of derived fragmentation (04)

(b) Consider a data warehouse storing sales details of various goods sold, and the time of the sale. Using this example describe the following OLAP operations

- (1) Slice (2) Dice (3) Rollup (4) Drill down (10)

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Q 5.

- (a) Clearly state the differences between OLTP and OLAP (10)
(b) With the help of a diagram explain the architecture of a Data Warehouse (10)

Q 6. Write short notes on any two of the following: (10 marks each)

- (a) ETL Functions of a data warehouse
(b) Advanced recovery techniques in a database
(c) Indexing Techniques in a Database